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ABSTRACT

The purpose of this study was to determine the nature of decisions made by trainees as they interact with mildly handicapped pupils during oral reading and to determine the effects of various training interventions on trainee decision-making behavior. Data obtained from simulated recall interviews at the beginning of the program indicated that trainees' explanations of their prompting behavior involved pupil variables three-to-one over explanations relating to instructional variables. Over the program life of two semesters, and with completion of a module on decision making and feedback, the trend was for instructional variables to replace pupil variables as a source for explaining prompting behaviors. A related study was conducted involving instruction in the use of prompts in response to pupils' oral reading miscues. No change in trainee decision-making behavior as measured by the reduction of relative response uncertainty was evidenced, although trainees became more proficient in the use of prompts as an instructional technique. (MB)

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The Effects of Training on Teacher Decision Making*

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Teachers decision-making has been receiving the increasing attention of teacher-education researchers (Gage, 1975; Shulman & Elstein, 1975; Semmel, M.I., 1975; Morrissey, P. & Semmel, M. I., 1975; Shavelson, 1975). The current interest in decision-making represents a shift from concern with observed teacher behavior to an emphasis upon determinants of that behavior. The improvement of teacher education, and by extension, the improvement of teaching, is said to rest upon "... an understanding of how teachers cognitively construct the reality of teaching and learning..." (Gage, 1975). In this view of teacher education, the emphasis is upon how teachers apprehend a given instructional situation and how they apply decision-making rules as a precursor of action. An understanding of the cognitive basis for teacher behavior would provide invaluable guidance in the design of more effective teacher education programs. It is therefore most important to ascertain the degree to which trainees decision-making behavior is based upon models related to instructional goals or the degree to which such behavior is random or reflective of non-instructional goals.

Objectives

The purpose of this study was to determine the nature of decisions made by trainees as they interact with pupils during oral reading, and to determine the effects of various training interventions on trainee decision-making behavior. This study was designed in tandem with a study of trainee prompting behavior in a CATTS practicum for pre-service teachers of the mildly handicapped. The CATTS program provided trainees with several training interventions including: (1) a module on decision-making for prompting pupils' oral reading miscues; (2) discrimination training on the Oral Reading Observation System (OROS), and (3) feedback of prompting behavior to trainees, by means of CATTS real-time and delay feedback, and also by means of audio-tape play back of lessons. The effectiveness of these training interventions was the subject of a related paper (Brady, 1977) whereas the concomitant trainee decision-making behaviors were the subject of the present study. A final report details the training interventions and outcomes of the project: The Development of Oral Reading Prompting Skills in a CATTS-Competency Based Teacher Education Program for Pre-Service Teachers of the Mildly Handicapped (Semmel, M.I., Brady, M.E., & Semmel, D.S., 1977).

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Methods

To obtain data on decision-making a stimulated recall interview was conducted in which an audiotape of the trainees previous lesson was played back to the trainee. An interviewer stopped the tape after each pupil miscue and asked the trainee a series of questions designed to elicit trainees reason(s) for prompting as they did. The trainees' responses to the stimulated recall interview were subsequently classified by means of a 12 category classification system which clustered into 3 main areas: (1) Trainee focus on learner characteristics and goals for learner, (2) trainee focus on instructional content, text characteristics and instructional goals, and (3) trainee reiteration of actual behavior (no rationale provided).

The second source of data on trainee decision-making was from the observed performance of trainees during oral reading lessons as coded on the Oral Reading Observation System (OROS) (Brady, Lynch, Cohen, 1976). The performance data was analyzed with information/uncertainty statistics (Coombs, Dawes, Tversky, 1973) which have been used as a measure of decision-making in previous studies of teacher decision-making (Salomon, 1970; 1968; Sieber, 1968) and have been suggested by Shavelson (1975) as a useful indicator of teacher decision-making.

The Stimulated Recall Interview was replicated three times over the two semester CATTS training and tutoring practicum. The first interview was conducted at the outset of the program. Observation data used for analysis of uncertainty of behavior were obtained from the first six lessons taught by trainees (Trial one or base-line period). The second interview was conducted during the first semester immediately after trainees completed an instructional module on prompting. Observational data in this period were from lessons taught immediately after completion of module (Trial 2). During the second semester, trainees received discrimination training on OROS and after conducting 18 lessons with either CATTS real-time or audiotape replay feedback, the third recall interview was conducted. Observation data was taken from the last two lessons in the third trial (feedback trial).

Results and Discussion

The purpose of the stimulated recall interviews was to obtain information from trainees on the reasons for their own prompting behaviors. Based upon this introspective technique of data collection, we found that the inexperienced trainees initially emphasized pupil variables as the basis for their prompting behavior. At the first interview, which took place during the initial week of teaching, trainees explanations of their prompting behavior involved pupil variables three to one over explanations relating to instructional variables. The pupil focus variables reported to be of importance by the trainees were: pupils' previous knowledge, generic cognitive characteristics, current attentional state and motivational state of the pupil. The trends in pupil-related variables as explanations of teacher behavior obtained in the second and third interviews are shown in figures 1 and 2. A decline in all pupil variables can be seen in these figures, but the largest proportional decline is seen in the pupil motivational state variable. It is possible to attribute these results

to a reduction of the trainees' initial anxiety over acceptance by the pupil or a concimitant growth in confidence about rapport with the pupil over the extended time period of the tutorial program. In either case, pupil motivation was seen as less important a factor in trainee behavior near the end of the program than it was at the outset.

The most dramatic shift in trainee's explanation of their own behaviors came in the concern over instructional variables (figure 3). While explanations centering on text characteristics and other instructional tactics (categories 6, 7, 8) remained at a consistent low level, trainees markedly increased the percentage of explanations focusing on comprehension and context cues during the second and third interviews. This finding reflects the emphasis placed upon these variables in the teacher training program. The influence of participation in the training program is seen in the increasing attention to context and comprehension as the underlying rationale for trainee behavior. This effect was noted by the interviewers who found that in two separate instances, trainees offered word context as an explanation for their prompting behavior when the sample of teaching used as the basis for recall could not be objectively classified as an instance of contextual prompting. In other words, even where the trainees had not adequately developed appropriate discrimination skills that permitted them to distinguish an instance of a context prompt, the primacy of context prompts as the rational basis for decision making was already established.

The finding that trainees responded to some interviewer probes by restating the prompting behavior may reflect the automatic nature of some teacher responses to pupil behavior. Such responses may be interpreted as evidence of an absence of a rational or decision-making basis of the teacher behavior. On the other hand, reiterative responses may be due to the interview method, in which all trainee statements were accepted without comment and a given interview sequence terminated after two probes. No trainee statements including restatements of the behavior were rejected, nor were such statements treated and differently than substantive answers to probes. This was because we felt that the risk of post hoc rationalization was probably quite high, and "forcing" answers out of trainees would only inflate the tendency toward such rationalization.

It is probably the case that a good proportion of teacher-pupil interaction takes place with little conscious mediation and some of this may be reflected in the trainees reiteration of behavior in response to the interview. The small decline in the rate of reiterative responses from 21% in the first interview to 17% in the last one (see Figure 1), may be due to trainee familiarization with the interview situation.

Response uncertainty. The argument was raised elsewhere in this paper concerning the reduction of response uncertainty as an indicator of teacher decision-making. In brief, the reasoning was that if teacher behavior in relation to a specific class of behaviors occurs with a high degree of predictability (low uncertainty), then teachers' use of decision rules to guide behavior may be assumed. If on the other hand, the teacher behavior (in relation to a fixed set of alternatives) occurs at or near random (high uncertainty), then the absence of a decision model may be inferred.

A teacher training intervention can be viewed as a method of reducing trainee response uncertainty. Within a limited domain, the effect of training on teacher behavior should be predictable in terms of increases or decreases in response uncertainty. In the CATTS-OROS training program, trainees were taught to use a series of decision rules to determine which prompts to give in response to pupils' oral reading miscues. The decision paradigm was as follows:

1. Determine whether the pupil miscue changes the meaning of the sentence.
2. Prompt only if the miscue changes the meaning of the sentence. There were a series of additional decision rules provided the trainees which were designed to aid them in selecting the most appropriate prompt to use if prompting was indicated. There were five different prompts stipulated by the training program as potentially appropriate or functional. These five prompts were by no means exhaustive of all possible prompting responses and a major goal of the training program was to assist trainees in using the five functional prompts and to eliminate the use of the so-called dysfunctional prompts from their response repertoire.

Given the decision making model which served as the basis for the CATTS-OROS teacher training program, the prediction that trainee prompting would be initially uncertain is warranted. That is, in the absence of explicit decision rules, consistent or rule governed prompting behavior would not be expected. Rather, a greater initial tendency toward trial and error prompting would be predicted. And the logical outcome of the hypothesized early trial and error prompting behavior would be the subsequent shaping of teacher behavior through reinforcement in the form of pupil responses (e.g., success rate, tension reduction, etc.). Thus, the outcome of teacher-pupil interaction over time alone would be in the direction of lowered response uncertainty - the same prediction proposed as the outcome of a teacher training intervention. But while the direction of teacher behavior changes in both instances would be toward reduction of response uncertainty, only in the case of a training intervention could the categorical nature of the behavior change be predicted.

The trend in the reduction of relative response uncertainty (table 2) was in the direction predicted but the magnitude of the reduction was nonsignificant for the trainees as a total group. Thus, changes in trainee decision making behavior as measured by the reduction of relative response uncertainty was not borne out.

Response uncertainty and teacher training. The second hypothesis that was posited concerning teacher decision-making behavior involved trainees' use of the five functional prompts. This is a direct test of the effect of training and feedback upon trainee decision making. A small percentage reduction of response uncertainty would indicate the success of trainees in achieving the behavioral criterion of using all 5 functional prompts at the rate of about 15% each. That is, the stipulated behavioral criterion was equal use of the five prompts and restated probabilistically, achievement of the criterion behavior would be indicated by maximally uncertain behavior.

Table 5 shows that for the trainees as a whole, reduction of uncertainty decreased over time (trials), indicating greater uncertainty in the use of the 5 functional prompts after participation in the training program.

During the second semester of the program, CATTS real time feedback was provided for half of the trainees in the group to aid them in generating the five functional prompts during teaching. The other half of the trainee group received a post-teaching audio tape of their lesson a contrasting feedback mode--designed as a test of the relative effectiveness of the two types of feedback in shaping trainee prompting behavior. As a result, improvement in the use of all 5 prompts was obtained by all trainees, with CATTS feedback group showing a significantly smaller percentage reduction of rH (table 5).

The behavior of trainees during the third trial (teaching with feedback) was of interest from the point of view of the effectiveness of feedback on trainee behavior. We have already seen that in this simple, noncontingent situation, trainees decision making was demonstrated over trials by changes occurring in the direction predicted. Trainee behavior after imposition of feedback (during the third trial) showed that there were no significant differences between the two feedback groups in the mean percentage use of each functional prompt. However, differences between the two feedback groups in the variance of the use of each prompt was significant. For example, while the CATTS feedback group showed a mean of 24.22% use of context prompts compared to 31.60% use of context by the audio FB group, the CATTS group standard deviation was 5.80% while the audio group SD was 23.42%. Overall, the variances for the CATTS FB group were significantly lower than for the audio F.B. group. Thus, training effects can be seen not only in the direction of the behavior change but in the homogeneity of trainee behavior under real time (CATTS) feedback conditions.

Table 1

Mean Percentage Distribution of Decision Elements for Each Successive Recall Interview Showing Trainees' Reasons for Prompting

	Recall Interview					
	First		Second		Third	
	X	SD	X	SD	X	SD
Class I; Trainee Focus on State of Pupil						
Category 1. Cognitive-generic state	13.45	(12.33)	12.99	(15.64)	9.99	(14.35)
Category 2. Motivational state	12.46	(11.95)	5.20	(7.31)	3.10	(5.79)
Category 3. Previous knowledge	24.04	(13.17)	24.42	(13.19)	20.25	(12.75)
Category 4. Attention-set	9.62	(8.87)	9.44	(9.52)	6.20	(12.56)
Total for Focus on Pupil	59.56	(16.79)	52.05	(16.66)	39.52	(24.05)
Class II; Trainee Focus on Instruction and/or Text						
Category 5. Comprehension-context	7.15	(8.48)	13.10	(13.05)	35.88	(23.55)
Category 6. Graphic cues	2.74	(4.93)	7.34	(12.56)	4.13	(8.06)
Category 7. Phonic cues	5.29	(6.89)	2.86	(5.79)	2.55	(5.90)
Category 8. Other instructional	4.04	(7.46)	4.87	(12.56)	1.22	(3.36)
Total for Focus on Instruction	19.21	(10.34)	28.17	(25.21)	43.78	(29.38)
Class III; Trainee Restatement of Behavior						
Category 9. Memory-recall	5.73	(9.25)	6.08	(9.40)	3.20	(5.76)
Category 10. Visual-auditory	12.22	(11.37)	10.73	(9.39)	7.85	(12.83)
Category 11. Linguistic	1.54	(3.98)	2.98	(5.97)	4.75	(8.66)
Category 12. Pictoral-other	1.74	(4.76)	.00	(.00)	.89	(3.57)
Total for Restatement of Behavior	21.23	(13.41)	19.78	(14.61)	16.70	(22.80)

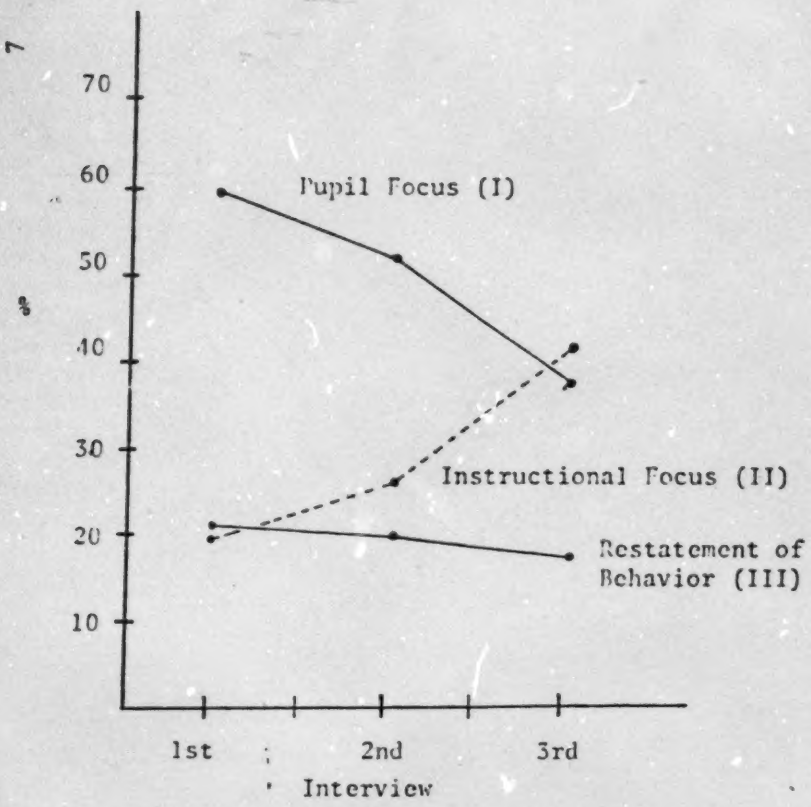

Figure 1. Trainee's reasons for prompting given in recall interviews.

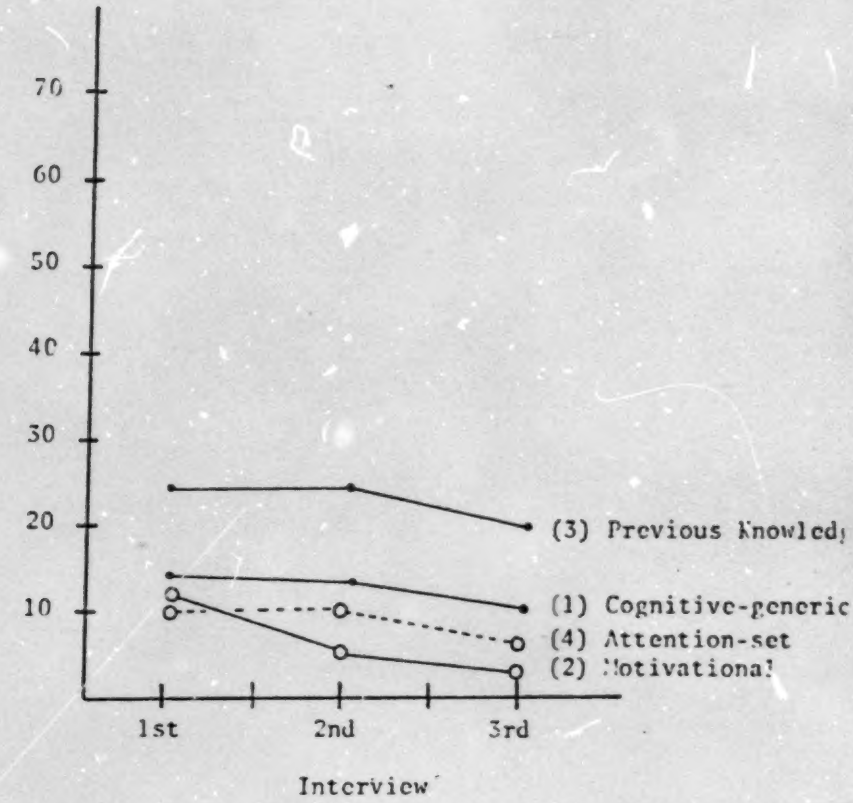

Figure 2. Trainees' reasons for prompting: Subcategories of the pupil focus classification.

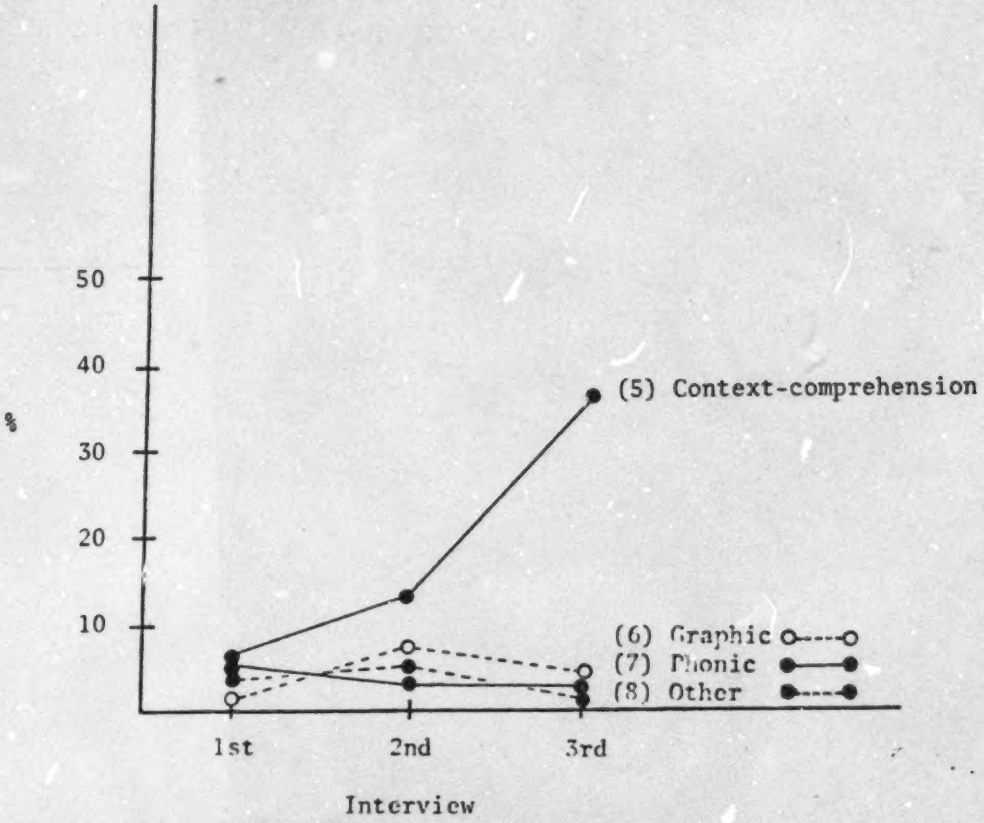

Figure 3. Trainee's reasons for prompting: Subcategories of Instructional/Text focus.

Table 2. Reduction of relative response uncertainty (rT)*, mean percentage and SD for all trainees.

Observation Periods	lessons	rT $\bar{x}$%	rT SD	n
Trial 1. Baseline	1-6	22.25	(9.14)	20
Trial 2. Post-instructional module	7-12	25.70	(15.85)	20
Trial 3. Post-feedback (second semester)	17-18	26.37	(15.76)	19

*The larger the percent reduction of relative response uncertainty, the more constraint between pupil behavior and subsequent teacher behavior.

Table 5. Percent reduction of uncertainty in trainees' use of five functional prompting alternatives (rH)*

Observation period (first semester)	All Trainees			Module after 6 lesson baseline			Module after 10 lesson baseline		
	x%	SD	n	x%	SD	n	x%	SD	n
Trial 1 Baseline	42.93	(24.14)	20	39.77	(24.92)	10	46.10	(24.24)	10
Trial 2 Post-Instructional Module	39.20	(21.47)	20	26.27	(22.17)	10	42.14	(21.50)	10

Observation period (2nd semester)	All trainees			CATTS FB Group			Audio FB Group		
	x%	SD	n	x%	SD	n	x%	SD	n
Trial 3 Post-feedback	20.22	(11.44)	19	13.76	(8.89)	9	26.03	(10.52)	10

*The smaller the percent reduction of uncertainty, the more uncertain the behavior. Thus, where uncertainty is great, Ss may be said to be generating all categories of behavior at about equal frequency (e.g., the use of each of five alternatives are equiprobable).